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The Art Department

Every Bit As Good As Expected
Amiga Review by Bill Raecke

I've been waiting for *The Art Department* since April. It was then that pictures processed with *The Art Department* began showing up on the networks and in the club library. The program went on sale in May in some parts of the country but, strangely, was not available locally until late July. So in the meantime I've been (not so) patiently awaiting its arrival. Judging from the quality of the pictures available I expected wonderful things. *The Art Department* (TAD) seemed to be able to do things that no other program until now has been able to do. I am happy to report that all my expectations were met.

First a brief explanation. What is *The Art Department*? It is an image processing program from ASDG. If you are familiar with PixMate or Butcher then you have some idea of what that means. Basically it allows you to import a picture file and modify it in various ways to fit your particular needs or desires. That's as close as I can come with one sentence. Hopefully it will become a little clearer as I go along.

Loading an Image

The first thing to know is what kind of images can be loaded into TAD and processed. That's not as easy to answer as it sounds. The picture load routines are stored as separate "Loaders". When you purchase the program, you get two Loaders as part of the deal. The first is called a Super-IFF Loader. This is the one that most people will use. It will load pictures in all the standard Amiga screen modes (1 through 5 bit-planes), the Extra-Halfbright mode, and HAM (4096 maximum on-screen colors). In addition, it supports the newer (and not quite so standard) modes: Sliced-HAM (SHAM), A-HAM or Dynamic HAM, and A-RES or Dynamic Hi-Res. It will also load files in the standard IFF format that have 12, 15, 18, 21 and 24 bit-planes. This includes those produced with Digi-View 4.0.

The second Loader supplied with the program is the DV21 Loader. This one will load images saved in Digi-View 3.0 and Digi-View Gold's 21 bit format. This

Loader and the Super-IFF Loader will meet the needs of most users. For those with special needs, there are Loaders available to support the Rendition format (Calagari Broadcast), the Impulse format (Turbo-Silver), the Sculpt format (Sculpt and the Mimetics frame buffer), the GIF format, and others. These are available for a nominal extra charge.

Whatever format you load, *The Art Department* translates the incoming image to 24 bit-planes (16,777,216 colors) if it is a color image or to 8 bit-planes (256 gray shades) if it is a gray-scale image. From that point on, they are all treated the same. In the normal Amiga color scheme, each color register (Red, Green and Blue) has 16 possible values, usually numbered 0 thru 15. This is where the Amiga's 4,096 possible color values come from (16 to the power of 3 = 4096). In TAD's color scheme, each color register has 256 possible values. This gives a much greater number of colors (over 16 million) and a much greater control over the image itself. Of course, it is not possible to see those extra colors on an Amiga monitor -- at least not directly. But TAD has a few tricks up its sleeve in that regard. More on that later.

The Color Controls

Now that you have the image loaded into the computer and it has been translated into the correct number of bit-planes you can begin to adjust things. There is a button called "Balancing". Click on this and you will be presented a series of settings to adjust the color values. Any adjustments made here are applied to all colors in the image. Increasing the brightness increases the values of the red, green and blue components equally for all colors. Decreasing the brightness does just the opposite. There is a control for increasing or decreasing Contrast. There are also controls for increasing or decreasing the Red, Green or Blue components of the colors. But by far the most powerful and unique feature in the color controls is the Gamma Adjustment. The Gamma Adjustment works by applying

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color changes unequally to the colors in the image. What it really does is introduce a curve to the color change equation. Colors at the darker part of the spectrum are modified more than are colors at the brighter end of the spectrum. The result is that the image is brightened but there is no loss of detail as there is when the "Brightness" control is used. This is an extremely powerful feature and one I have not seen elsewhere.

The second button relating to Color Control is the "Dithering" button. Remember earlier when I said that *The Art Department* had a few tricks up its sleeve when it came to displaying colors? This is what I was talking about. As

"...bring in a picture, change it to four colors, change the color to Workbench, apply dithering make up for the lost colors and reduce it. You've just made a terrific icon"

the manual puts it "Dithering is a technique for achieving greater color fidelity at the expense of spatial fidelity". In other words, the image will be less sharp but will contain a greater number of apparent colors. We know that the Amiga can only display 4,096 colors, but if two of those colors are put next to each other and repeated in that fashion, and if the dots are close enough together, the eye will see a blending of the two colors -- a new shade. Since TAD is working in over 16 million colors, it knows what it wants to show you -- but it also knows the limitations of the display. It uses dithering techniques to more accurately portray the desired image. This becomes extremely important when reducing the number of colors in an image. Sometimes it works so well it is difficult to tell that colors have been eliminated. *The Art Department* supports six dithering methods if you include "None" as a dithering method. They have varying effects on the image. Trial and error is the best approach. If one method doesn't give the desired result, try another.

There is one more set of controls under the Color Control umbrella. That one is "Palette". I won't go into it in great detail. Let me just say that it has every feature you've seen in other programs. It even has one more. It has a button to call in the palette from the Workbench. That may not seem too important until you consider -- bring in a picture, change it to four colors, change the color to Workbench, apply dithering make up for the lost colors and reduce it. You've just made a terrific icon. But I'm getting ahead of myself. We haven't talked about reducing anything yet, have we?

There is one more thing I need to emphasize before I finish writing about the Color Controls. When trying dithering techniques or changing the color balance, all the changes are made to the display only. The original image remains unchanged. This makes trial and error a breeze.

Screen and Image Controls

There are 208 possible video modes. An image can be converted from one mode to another at the click of a button. Modes available include such things as SHAM and Dynamic Hi-Res.

There are buttons to flip the image horizontally and vertically. There is another button that changes a 24 bit-plane color image to an 8 bit-plane gray-scale image.

The "Scaling" button can take an image and reduce or enlarge it to your specifications. The reducing function in TAD is something that must be seen to be believed. An image can be reduced from full screen to icon size with no apparent lack of clarity. In fact, there is a loss of clarity as can be proven by re-enlarging the reduced image to the original size -- but it is not apparent. It's really amazing. Chalk it up to those terrific dithering routines.

If all that weren't enough, there's one more neat trick that the program will perform. The RIP button will Remove Isolated Pixels from your image. It scans the image looking for a pixel of one color which is surrounded by eight pixels of a single other color. When it finds such a pixel, its color is changed to that of the surrounding pixels. This can be extremely helpful in cleaning up images if you have undesirable specks here and there.

Color Separations

There is a "Separate" button that allows you to do color separations from your image. There are three types of color separations supported. The RGB separation splits the current color image into its Red, Green and Blue components and saves each plane in a separate file. Three color separations convert the image into cyan, yellow and magenta planes. Four color separations convert the image into cyan, yellow, magenta and black planes. Four color separations are the current standard for the print industry. Each type of separation can be performed with 12 or 24 bit-plane accuracy.

Saving Your Work

The "Save" button brings up a menu with three choices. It is possible to save the raw 24 bit-plane or 8 bit-plane image. It is also possible to save the screen image. This means that if your image is larger than the screen display, you can scroll around until the portion that you are interested in is shown and then save only that portion. The third option is to save the entire image regardless of whether it is displayed or not.

System Requirements

Those with small memories need not apply. (Nor those whose Amigas have little memory). It will run on a one megabyte Amiga but the manual suggests "a minimum of four megabytes of expansion memory in order to get any substantial work accomplished." *The Art Department* will swallow up all the contiguous memory in your computer. The amount of memory actually required to process an image depends on the image to be processed. For color images it can be calculated multiplying the width in pixels by the height in pixels and multiplying the result by 3.75. In

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other words, a 640 X 400 color image would require 640 X 400 X 3.75 = 960,000 bytes of CONTIGUOUS memory. For a gray-scale image, use 1.5 as the multiplier as the program will only require 8 bit-planes rather than 24.

Summary

Actually, the memory requirements may be the only drawback to the program. It installs easily on a hard-drive and is very well behaved. I have been multitasking with it as I write this article so that I can switch over and test things before I write something dumb. Even running in this fashion there have been no glitches of any kind. Of course, looking at my memory counter shows that I have only 991K free. Ordinarily with just a word processor running (plus all

the things that are always running in the background) it would show about 3800K free.

Of course -- the price. This has got to be one of the greatest bargains in the universe. It sells locally for about \$70. The extra Loaders, if you need them, go from about \$24 to \$50 list. Since very few of us will require many of them, that makes that price reasonable as well.

Overall -- in case you couldn't tell by now -- I'm thrilled with this program. *The Art Department* is the most powerful image processor I have seen -- and, for the money, is a steal. If you are interested in this type of program or if you just want to mess around and make a few outstanding icons, buy it. I can't recommend it highly enough.

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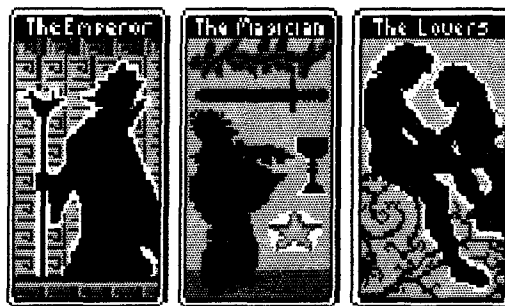
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THE FOOL'S ERRAND

Amiga Review by Barbara Cramer



The Fool's Errand is absolutely sensational. It is the first game I could not put aside even for the sake of a review. Having now completed the entire game, I can say without hesitation that I enjoyed every minute.

Created by Cliff Johnson, this adventure is more than a tale of enchantment for hidden behind every scroll of text is a puzzle or brain teaser. Over 80 puzzles of all shapes and sizes make up the main body of this delightful and often surprising game. On the traditional side there are word search and jigsaw puzzles as well as cryptograms and coded puzzles. On the creative side there are puzzles that could only exist on a computer, mazes with hidden doors and winds that carry you clear across to the other side of the screen.

My favorite puzzles were those that involved figuring out the rules. At one point in the game, you are invited to play a card game with an old man, a game of 700 points which you must at some time win in order to continue the story. Of course, no rules are given and you

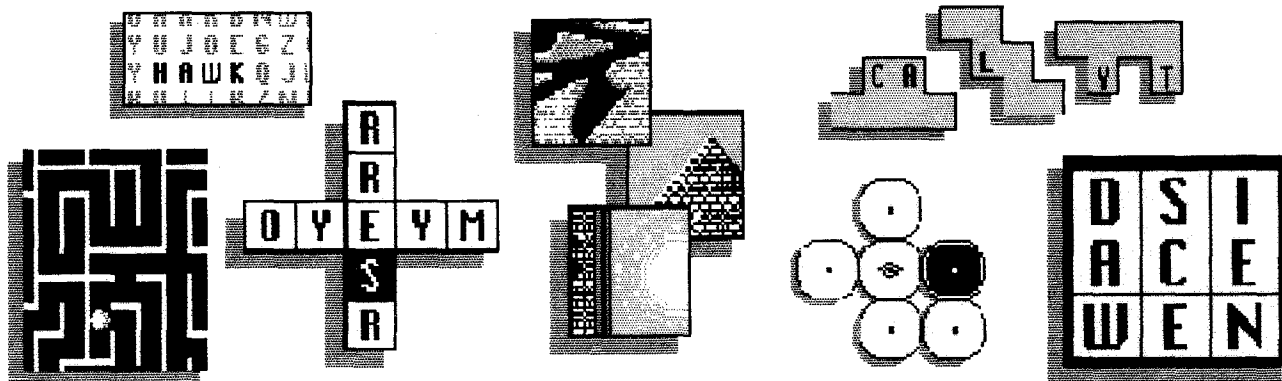
must watch the results to find out which cards make a pair and what beats what (poker style). There are 5 or 6 puzzles of this style where there is no precedent in the real world and you must use any and all ideas you have to discover a solution. Or you can just rely on getting lucky (which occasionally works)!



The level of difficulty varies as you get deeper into the story. While they are all easily solved by people of average intelligence (who like solving puzzles), I found myself trying to make the solutions much more complicated especially when I got stuck. Older children will enjoy many parts of the game as well because they have not yet learned all the rules of society that often get in the way of their law-abiding parents.

Despite its obvious appeal, I still managed to compile a wish list for the sequel. Since The Fool's Errand was originally written for one of those other computers, the authors and artists did not take full advantage of Amiga graphics and sound. The opening and closing animation sequences could have been nicely enhanced by the use of a background score and sound effects for lightning and thunder, at the least. Although it is obvious that all the graphics are drawn by professionals and excellently rendered, medium resolution and 16 colors is the format of all graphics. (Am I getting spoiled?)

The Fool's Errand is a unique adventure with excellent, colorful graphics, an interesting story and quite a nice array of visual, verbal and thought-provoking puzzles to stimulate, entertain and surprise you. (It will even copy to your hard drive for added convenience.) It is the only game of its type and one of the best games I have ever played. It is currently on the shelves at Amazing Computers in Fort Worth and Dallas for \$35.96 to MCCC members.



Their Finest Hour

Historically Accurate and Action Packed
Amiga Review by Craig Bird

The year is 1940 and the skies of Britain are filled with hundreds of aircraft as the German Luftwaffe attempts to knock out the British Royal Air Force and gain control of the British Isles as World War II escalates. Your mission, should you decide to accept it, is to defend the Crown against overwhelming odds or join the Third Reich in what must have seemed an easy victory ahead. *Their Finest Hour, The Battle Of Britain*, is a re-creation of the famous air battle in the skies of Britain from July to September 1940. This historically accurate, action-packed air combat simulation is filled with opportunities for the brave at heart and has numerous missions available to stimulate even the experienced fighter or bomber aficionado.

Getting started with *Their Finest Hour* is relatively easy. This two disk game loads easily from one or two floppy drives and is installable on your hard drive as it is not copy protected. Following the title screens you are given a choice of mission profiles from training flights that allow you to hone your skills in a variety of practice situations to combat and campaign missions, the results of which will count on your Combat Record. You can also create custom missions with the Mission Builder utility included. Joystick adjustment can be fine tuned or you can use the mouse if you prefer. Keyboard controls (included in the Reference Card) range from game control functions to weapons and cockpit controls. The bombers and some fighter aircraft have gun turrets and bombardiers also. Tuning your onboard radio gear is accomplished with the radio frequency cipher wheel. Although not an absolute necessity, the wheel is used to tune correct battle frequencies to receive vital information about enemy aircraft sightings shown on the In-Flight Map/Radio screen. Cockpit instrumentation and controls although similar to other flight simulators are well designed and easy to follow.

Using the 200+ page manual may seem a bit intimidating at first, but the author and creator Lawrence Holland recommends turning to the Loading Instructions first to get you up flying right away. You can use the Mission Instructions, covered in three chapters to learn how to select your mission, get your flight briefing and choose your flight roster. In-Flight gives you specific details about how to fly the different aircraft, drop bombs, use machine guns, and more. Post-Flight critiques your performance and points out how to win medals and promotions in rank.

When you've had some combat experience and want to know more about what really happened during the Battle Of Britain, read the Historical Overview and Pilots' Perspectives chapters for both a historical and personal view

of the conflict. There are even chapters on German and British Aircraft and Weapons. If you're still hungry read the Flight Fundamentals and Tactics chapter.

The actual missions in T.F.H. follow historically the air battles that occurred during the Battle of Britain. It is a game of course, and you determine how well either side does by your combat record. The Play Campaign menu lets you take part in various campaign missions, where you can change the historical outcome of the Battle of Britain if you're good enough.

I've been fortunate enough to play this game on several Amigas from a 512K 500 to a 2500/30 and even a 3000. Although the faster processors smooth out the screen updates somewhat, T.F.H. is very enjoyable on all of them. On the plus side, I like the accuracy of

aircraft control. This combat simulator won't let you engage in maneuvers that the real aircraft won't accomplish. If you're used to flying the F-18 or F-16, this will seem really slow and unresponsive. Let's face it, WWII aircraft didn't pull 9g turns or climb at vertical speeds in excess of 30,000 feet per minute. You also have to lead your machine gun or cannon fire....no missiles here!

The graphics, though low resolution, are very good. You can differentiate aircraft from different squadrons by their paint schemes, then watch as your enemy gets shot down and see his parachute open when he bails out. The bombers and multi-engine fighters have gun turrets that shoot down your opponent as he flies above you, and the bombardier function operates with accuracy. If you have some real aviation experience you'll appreciate how realistic this simulator operates. The only down side to T.F.H. is that it is somewhat noisy loading from floppies and as with most graphic intensive games it takes a while. Hard drive users will appreciate the faster loading and screen changes. In addition to its educational benefits, *Their Finest Hour* is a truly enjoyable and interesting combat simulator. Software for this review has been provided by Clark Smith of Electronic Arts. Thanks.

***Software for this review was
provided by Clark Smith of
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Amiga Library News

Public Domain and Shareware Picks From Bill Raecke

FMS Disk

This program probably has limited usefulness for a lot of people but if you have a use for it, it will be invaluable. What it does is set up a file on your hard drive that looks and acts exactly like a floppy drive. Right off the bat that eliminates anyone who doesn't have a hard drive. But if you have one, read on.

To set it up you move an `fmsdisk.device` to your `devs:` directory and then you add an entry or entries to your mountlist. The first time you mount the device you will have to format it or do a diskcopy to it in order to get things started. Once established, the file will remain ready to use just like any device. All that it takes to get it started again after a reboot is to issue the mount command and access the device in some way. You may have up to 32 FMS devices mounted if you have a need for that many. And they may be either normal file system or fast file system devices. Don't expect the same speed that you are used to from your hard drive but I guarantee that it is MUCH faster than floppy speed.

Thought of any uses yet? I use it to prepare the MCCC Disks of the Month. It's a lot faster to prepare the disk using an FMS device and copy it to floppy when the work is complete than it is to work directly on the floppy itself. Anyone building a floppy for any reason should be able to use it similarly. I can also see a use for someone who has a hard drive but who has limited RAM and only one floppy. To make a diskcopy with a single pass, just mount an FMS device, do a diskcopy from the floppy to the hard drive and then reverse the process onto a fresh floppy. There are probably many ways to use this program that don't spring immediately to mind but give it some thought and I bet you'll come up with some.

There are no problems that I have been able to detect. It has worked flawlessly for me for over a month now. The only limitation is that the Amiga Workbench doesn't seem to recognize it the same way that CLI does. Diskcopy only works from the CLI. The other Workbench functions work just fine. Icons and windows function just as they always have. Check it out. It's on MCCC-A_204.

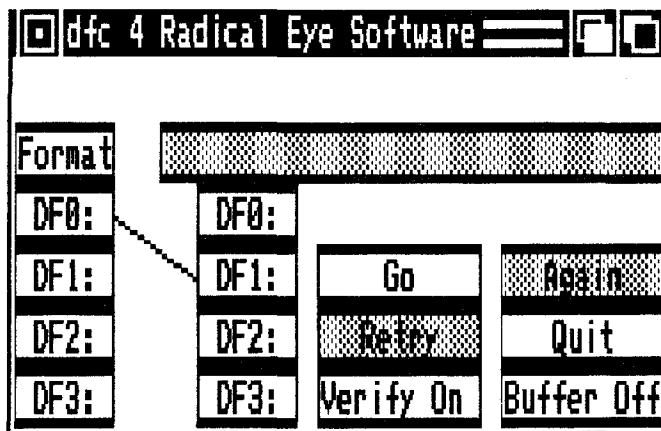
DFC 4

DFC is a program I've been using for years now. *DFC 4* is simply the latest version. It's worth mentioning not because it's new but because there may be someone out there who doesn't know about it and who isn't using it. So, for all of you who don't know what *DFC* is, listen up.

DFC is a floppy drive diskcopy and format utility. It works at the same speed as the AmigaDOS programs that do the same thing so speed is not its virtue. It also works just as reliably as the AmigaDOS programs that do the same thing. That is a virtue. There are no other diskcopy utilities that can make that claim. But so far it's just as good as

AmigaDOS. So why use it?

DFC has two outstanding features. First and foremost is its ease of use. Making a copy of a floppy on an Amiga that runs its Workbench from a floppy requires multiple disk swaps. It becomes next to impossible to accomplish if there is only one floppy available. *DFC* makes it all easy. First you run the *DFC* program (from Workbench or CLI). That brings up a window with buttons for each of the four possible floppies and several command buttons. If your system has two floppies, `DF0:` and `DF1:`, there will be a line drawn between those two buttons. This indicates that, by



default, the disk will be copied from drive 0 to drive 1. Clicking on the various buttons will draw or erase those lines to indicate the desired function. Drawing lines from `DF0:` to `DF1:`, `DF2:` and `DF3:` indicates that three copies of the disk will be made at the same time. Or try this: Draw a line from `DF0:` to `DF0:`, push the "Buffer Off" button so that it reads "Buffer On", and press the "Go" button. If you have sufficient memory, the entire disk will be read into memory, you will be prompted to insert a target disk, and the disk will be written from RAM. If you do not have sufficient memory, you will be prompted for disk swaps.

But that brings me to the second outstanding feature of the program. If you have sufficient memory, it is possible to read an entire floppy into memory and make multiple copies of it without re-reading the source disk. By pressing the button marked "Again", the disk currently in memory will be written to the destination drive or drives (as before, it is possible to write to more than one destination at the same time). The only limitation is that it works only on true floppies. The FMS device is not supported.

The program works without a hitch. It is extremely reliable and very easy to use. Give it a try. *DFC 4* is a public domain release from Radical Eye Software and is in the public domain. You'll find it on MCCC-A_206.

American Bandstand

American Bandstand is a sound file. That's right, a sound file, not a music file. That is what makes this entry unique and it is why it is mentioned here. There are actually a couple of reasons why it bears mentioning.

First, since it is a sound file (that it, digitized sound) this is an actual recording of the theme music from the original TV show "American Bandstand", not just a new scoring of the music. Second, this is high quality stuff. It may not be what you are used to hearing from your stereo, but I bet it sounds just as good as what you heard back in the 50's off the TV (if you were around back in the 50's). Third, this is the biggest sound sample I have ever seen. It measures 711,848 bytes on disk. It plays for a full two minutes. That represents the entire theme.

Don't let the size of the file scare you off. Using the latest version of Sound, the sound player utility, it should be possible to play this on a 512K Amiga. Sound is included on the disk for your convenience so all you need to do is point and click. Also included is the LED program that turns off the Amiga's sound filter to allow you to fully appreciate it.

American Bandstand is released as shareware from Splunge Productions. In return for your \$7 donation you will receive another sample. You'll find this one on MCCC-A_204. Let's rock n' roll.

WellTrix

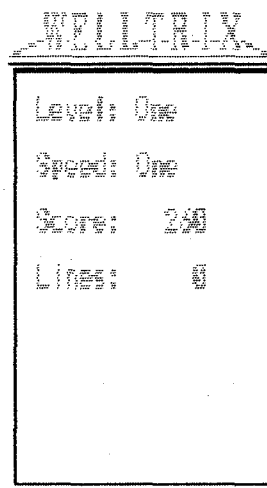
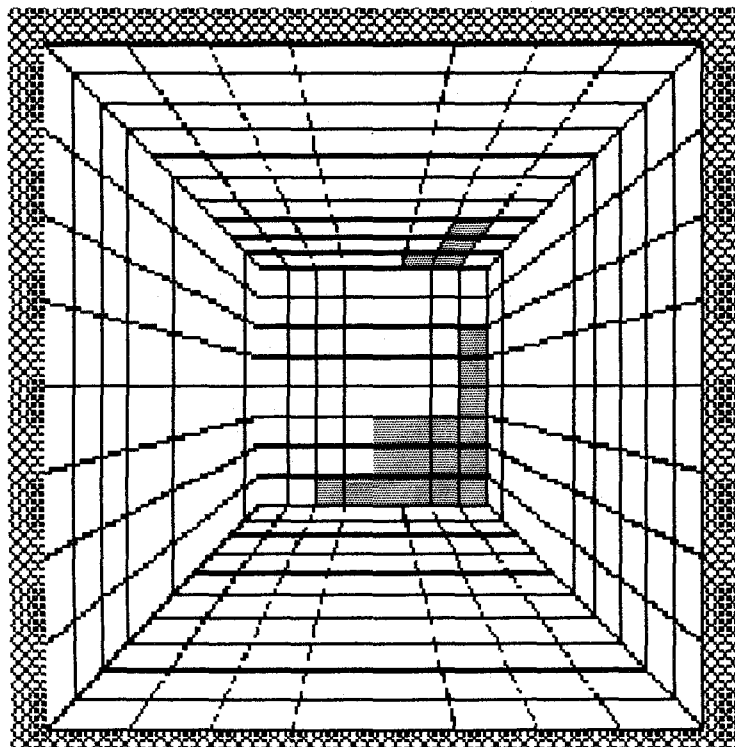
Do you enjoy Tetris? Interested in a 3D version? *Welltrix* is a freely distributable copyrighted offering from

Gary W. Milliorn patterned after WellTris by Spectrum Holobyte. It's well done and worth your time to check it out.

So, you're probably wondering what a three-dimensional game of Tetris is like. The game is played looking down a well. The pieces appear at the top of the well. You rotate them the same as in Tetris. The keys which would normally control left to right movement in Tetris are modified so that they control rotation around the well in *WellTrix*. This means that your pieces can be made to fall down any of the four walls. When the piece hits the bottom of the well it is no longer possible to control it. From that point, it slides across the bottom of the well until it hits another piece or the opposite wall of the well. The idea, as in Tetris, is to complete an entire row. When you do, that row is removed, the remaining pieces move to fill the gap, and the game continues. When you drop a piece such that it comes to rest with all or a portion of it remaining on the wall, that wall becomes unusable for the next three pieces. If you are unable to successfully play at least one of those next three moves, the game will be over because all four sides will be locked.

WellTrix also offers many options. You may use it with the font and colors of your choice. You may also replace the sound files used with the game so that the sounds of your choice are used. (Lots of cheering might be nice.)

I think you'll like it. Check it out. It's on disk MCCC-A_205.



The Future of Disk Storage?

Article by Clete Baker

Reprinted from the Amiga Users of the Heartland Newsletter

Prologue

One of my own personal heroes is Douglas Hofstadter, Pulitzer Prize winning author of *Godel, Escher, Bach*, and for a few short years, columnist for Scientific American magazine. Among the many *Metamagical Themas* columns he penned for that periodical was one on the subject of "innumeracy" -- a term coined in 1959 by economist, Sir

"...scientists at I.B.M.'s Almaden Research Center ... announced the achievement of the current world record for magnetic data storage density: 1 Gigabit of information (125 Megabytes) stored in one square inch."

Geoffrey Crowther, for an utter lack of competence with numbers. It is, as the term implies, the numerical parallel of illiteracy which besets a huge number of us as the numbers we contemplate become huge.

I'm afraid I have to count myself among the numbers of the innumerate. Once I'm beyond the size of my bank balance (and that isn't very far) my ability to conceptualize numbers dwindles rapidly. For example, I've actually seen an assembly of 50,000 people in one place at one time, but I can't begin to imagine what a crowd of 1,000,000 people would look like. More importantly, since I can't visualize 1,000,000 people, 10,000,000 people is equally vague, as are 100,000,000 and 1,000,000,000.

And there's the rub. Beyond a certain threshold such numbers become meaningless. I'm aware of the fact that 1 billion is greater than 1 million by three orders of magnitude, but it's entirely academic since I haven't a tangible grasp of either number. Those two, along with all the numbers in between, simply blur into unfathomable enormity.

Among the examples related by Hofstadter to impress upon his readers the sheer size of a number like One Billion was this one: his favorite microcomputer at that time (around 1980) was valued at about \$4,000. To put it into our perspective, that amount should be sufficient to purchase a new Amiga 2500/30, complete with multiscan monitor. One Billion dollars is sufficient to buy such a system for each resident of the city of San Francisco and its suburbs, and still have enough left over to buy a bicycle for every man, woman, and child in all of China. Think about this as you read on.

World Record Achieved

An AmigaDOS floppy disk holds not quite nine tenths of a megabyte of storage. Hard drives usually start at around 20 megabytes and are now quite common in sizes up to 100 megabytes and beyond. Many of us are enthusiastically awaiting erasable optical disc technology, which is expected to offer capacities in the realm of 500 megabytes on a Compact Disk.

Meanwhile, scientists at IBM's Almaden Research Center in San Jose recently announced the achievement of the current world record for magnetic data storage density: 1 Gigabit of information (125 Megabytes) stored in one square inch. At that density, a disk the size of our 3.5 inchers could hold 2.3 Gigabytes of raw data (thank you, Power Mouse, for the calculation of swept area on a 3.5-inch disk). Written out, that's 2,355,200,000 bytes. Of course, that doesn't mean that all of it would be available to us for storage. As density increases, reliability decreases, meaning that some of the newfound storage capacity is usurped by error detection and correction overhead.

The exciting part of IBM's announcement is that they've achieved this density with what might be considered garden variety tools; nothing particularly exotic puts this out of reach of today's manufacturing capabilities. The process uses a combination of new recording head technology and a magnetic cobalt alloy recording medium designed for greater data density and low noise. Not only is it dense, but it's fast, too. The prototype equipment on which this storage density was achieved reached a read/write rate of 3.5 Megabytes per second.

In spite of IBM's successful prototype, it will still be several years before this technology can be exploited commercially.

Reaching the Molecular Level

While you and I may be impressed by the magnitude of IBM's achievement, there's a group of scientists at Oak Ridge National Laboratory which is greeting IBM's news with sly smirks. Oak Ridge National Laboratory is one of the largest government research laboratories, run by the Department of Energy and operated under contract by Martin Marietta Energy Systems. A new development there promises optical storage capacity at the rate of a terabyte per square centimeter, and in half the access time of current optical technology.

Would you like to see that number written out?

1 terabyte = 1,024,000,000,000 bytes.

A trillion bytes. And change. That's one big number. But wait -- consider that this is a density specification: 1,024,000,000,000 bytes per square centimeter of media surface! Or roughly 20,000 times more dense than IBM's

world record (it will fit 20k, or a program about the size of TXEd into the space consumed by one byte of IBM's new technology).

How Do They Do That?

Oak Ridge researchers have stumbled serendipitously onto a technology capable of turning a single molecule on an optical disk into a storage point by changing its polarity, marking that molecule as plus or minus. The technology employs lasers to both read and write data, much as does current optical disk technology. However much less power is required to alter a single molecule than to burn a hold or pit into the surface, as in current technology.

At this stage the new method is the result of basic research; it has not yet been applied to a practical purpose. The research was not aimed at solving problems of data storage on optical disc, so the technology remains rudimentary and, yes, very exotic from the standpoint of manufacturing. Martin Marietta's scientists were working on a project to develop a system for the detection and identification of minute trace amounts of organic compounds. They had developed operational radiation detectors, and happened upon the discovery that they could leave information on a substrate at the molecular level with a laser.

"A new development ... promises optical storage capacity at the rate of a terabyte per square centimeter, and in half the access time of current optical technology."

In this basic form the technology is WORM (Write Once, Read Many), however many of the companies who have licensed the technology from Martin Marietta are undoubtedly expanding upon their research, looking for a way to make it erasable.

Numeracy Lesson

To put the enormous storage capacity of this technology into focus, consider this: the one terabyte per square centimeter potential storage density of this technology is roughly one million times as dense as a present day CD-ROM. Imagine that every byte of a 500 megabyte capacity CD-ROM could potentially contain a megabyte of information under the new technology. This newfangled medium (as yet unnamed) could store 512,000,000,000,000 bytes. That's 512 trillion bytes. 512 thousand gigabytes. Or a library of 568 million AmigaDOS floppies; enough for the equivalent of several hundred floppies for each Amiga owner world wide, all on one CD sized optical disk. And as if its ponderous volume isn't enough to impress the daylight's outta ya, it's faster, too, as more data can be input (and, one presumes, output) at current optical disc rotational speeds.

Of course, I'm getting a bit carried away with the

suggestion that in the near future you'll actually be able to store that amount of data on one disk. When you get that much data packed into so little space, error detection/correction becomes absolutely crucial and the overhead consumed by data redundancy (the only safe bit is a duplicated one) swells. So in the real world of future products, don't expect to see the linear increase in density that I've implied above. Still, even on a real-world device I don't think AHOH's sizeable library would make much of a dent in its capacity. Heck, if the overhead amounted to as much as 80% you'd still have the equivalent of 100 million or so AmigaDOS floppies....

At the time the original article appeared, Martin Marietta claimed to have discussed licensing the technology with over 40 companies, four of which had already signed agreements and had received full access to their research. Surely, many more have jumped into the fray in the last 14 months.

It's anybody's guess when, if ever, this technology might appear on the shelves of your friendly local computer monger. But it's safe to say that it's still a couple years off at least. So don't hold your breath while waiting. Of course, for my part, I'd just be happy with a measley 100 megabyte Winchester now that I finally have a couple megs of RAM. Well... for a while, anyway....

BC

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The MCCC Amiga Library SuperDisks

Library Information From Harold Williams

The MCCC library consists of public domain and freely distributable files and software. The SuperDisk collection is a subset of the MCCC Amiga disk library. This collection contains a selection of some of the best programs from our current library of about 800 disks. Each SuperDisk is packed with programs that are similar in function. The programs on the SuperDisks come with instructions and a utility to read and print the instructions. As new versions of these programs are released the disk is updated. The SuperDisk collection is constantly changing, growing and improving. The SuperDisks are available at each Amiga chapter meeting. The fee of one dollar per disk is used to cover the cost of the disk and help defray the cost of the meeting rooms. Some of the included programs are shareware and require a donation to be sent to the author if you choose to keep the program. The SuperDisks are a terrific introduction to the MCCC Amiga library and a simple way to keep up to date on the latest versions of your favorite utilities.

The SuperDisk collection currently consists of these twelve disks:

SD-DiskUtil	Disk and File Handling Utilities
SD-Games01	10 Super Games
SD-Games02	More Super Games
SD-Math	Plotting, Fractals, Mandelbrots
SD-MiscUtil	Miscellaneous Utilities and Programs
SD-PicUtil	Picture Utilities
SD-PicUtil2	Picture Utilities
SD-TeleComm	Telecommunications Programs
SD-TeleUtil	Telecommunications Utilities
SD-WBUtil	WorkBench and CLI Utilities
SD-WBUtil2	WorkBench and CLI Utilities
SD-WBUtil3	WorkBench and CLI Utilities

This article is the beginning of a series of articles that I am writing to describe the contents of the SuperDisks. This article will provide a description of the utilities included on SD-DiskUtil.

SD-DiskUtil contains seventeen utilities designed to ease the manipulation of files or whole disks.

ASDG-VD0 creates an extremely powerful RAM disk. VD0 is a combination of the best features of the standard RAM and RAD devices. Like RAM, VD0 only occupies the memory needed to hold its current files. And like RAD, VD0 will survive a reset.

There are two disk copy utilities included on SD-DiskUtil. DFC uses a simple point and click interface to copy standard AmigaDOS disks. DFC will create as many as four copies at one time. This is the utility I use for making SuperDisk copies. The other disk copier is NIB, an incredible nibbler that will copy many non-standard disks.

DiskOpti and FastDisk are utilities that will reorganize the files on a disk to increase the file transfer rate. I use one

of these optimizers on every SuperDisk.

DiskView will show you the actual sector by sector file layout on a disk.

DiskSalv is designed to recover data from damaged disks. Its function is similar to DiskDoctor, but works in a different way. DiskSalv does not modify the damaged disk, but copies all recoverable data to another disk. DiskSalv is absolutely indispensable.

DPerf is a disk performance monitor. It tests the speed of file transfers, file creation, file deletion, etc.

Another utility called Drive will provide data about a drive's physical characteristics such as capacity, sector size, interleave, number of buffers, etc.

There are two sector editors. DiskX is a disk based sector editor. It uses track and sector settings to browse and edit a disk in hex. NewZap is file based sector editor. NewZap will follow a file structure to allow browsing and editing.

DirMaster is a slick cataloging utility. This program can help you keep track of the files in your disk library.

DOSKwik is a unique utility that provides super fast file reading capability. DOSKwik will store a series of files on a disk in a special format so they can all be quickly copied to some other device (such as RAM).

PowerPacker can be used to compress executable files to about half their normal size. The packed files can still be executed because the unpacking utility is built into the packed file. If you are out of disk space this utility could solve your problem.

UtiliMaster is what is commonly called a directory utility. UtiliMaster will display two directories and allow all sorts of manipulation of the files. Files can be copied, renamed or deleted. Text files can be read or edited. Sound files can be played and picture files can be viewed. A group of files can be made into an ARC, ZOO, or LZH archive. Existing archives can be dissolved into individual files. UtiliMaster can do just about anything you would ever want to do with files.

Last, but certainly not least, SD-DiskUtil contains VirusX and KV. These two utilities can protect your disks from most viruses.

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Xetec Lt. Kernal Harddrive System

C64 Hardware Review by Todd Wilson

From the Newsletter of the Salt City Commodore Club

I am currently running a local BBS. I have been running one for three years now. We have seen a lot of changes over the years in hardware and their prices. This year I decided it was time to expand, go big time! I looked around and checked places for the current prices and brands of harddrives available for the Commodore 64 and 128. To my surprise I found that there are only three harddrive systems available for the Commodore.

The first one, I believe, was the CSI 10 meg harddrive. This appeared to be what some would call a 1541 harddrive. It operated in the same way with little expansion, no speed and had several problems with DOS and just generally didn't work well with the Commodore.

My second look in to the world of harddrives was the ICT Data Chief Harddrive systems. This is a 20 meg system, which can be expanded up to 150 megs. This is really the first Commodore 64 and 128 harddrive. My first big problem was the fact that the company that made it went out of business! No support, no updates or parts; nothing. The harddrive worked in a basic sense of having 150 1541 drives working for you. You have to assign certain areas to certain directories for the BBS to run. It also was the same speed as the 1541. Its price was around \$850 for a 20 meg system.

My next search ended with the Lt. Kernal harddrive from Xetec Co. in Salina, Kansas. I talked to support people there about my situation and to the other sysops and people who had them. I was sold! The Lt. Kernal was the harddrive for me! I could be purchased for around 700-900 dollars for a 20 meg system. It could be expanded to 150 megs. It was a for-real harddrive system. It had awesome speed enabling the little old Commodore 64 to load 140 blocks of program in 1 second! The access time is 19.2ms, which is faster than some IBM's. The way Xetec got the speed is from a host adapter which plugs into your cartridge port on your 64 or 128. When you boot up your system,

you must wait for the harddrive to run up to 3600 rpms. All the while, your screen is black. The host adapter will load DOS and then the autoboot sector if you want a program to autoboot at power up. I currently have my BBS set this way, so if the power goes out, it will boot up on its own when the power comes back on. You may set up to 10 LU's (logical units) which would be the equivalent of 10 disk drives on one harddrive. Inside every LU is a USER, which is a directory. You may have 16 USERS or directories in each LU.

As far as having all of your commercial software in the harddrive to boot up is a controversial issue. Some programs will not survive the transfer from floppy to harddisk. This may be due to the copy protection method or the use of several files.

Xetec has come out with an ICQUB feature. This is pronounced as ICE CUBE. It loads a program into memory and then freezes the memory to make a bootable file on the harddrive for the game. This worked perhaps 50% of the time. This bypasses the copy protection on the floppy. You cannot copy read errors and such, that are put on the floppy to halt copying, onto the harddisk. This ICQUB file will **ONLY BOOT UP ON THE HARD DRIVE!** This is not the way to copy games! As for the DOS for the Commodore, it closely resembles MS-DOS. You can still have CBM DOS commands as well.

You can still use floppy drives and use your computer all the ways you have done before plus all the other things that come with the harddrive. Compared to harddrive for the IBM and others, it is much higher in price, but you must consider the price of the IBM as well. This has been the best piece of hardware I have bought for my Commodore, but I do not recommend it for the average home user. Reasons for this are merely the fact of price and that it is not a replacement for the good, old. SLOW 1541 floppy! Without my 1541, the harddrive is nothing!

Bridgeboard For Sale

Well, here it is -- your opportunity to own your very own 2088 Bridgeboard. It is the A2000/IBM-PC XT compatability board. Also included in this deal is a math co-processor. Plus as an added bonus you get another card that adds a port output but what else it does I'm afraid I don't know. Maybe you can tell me! I have the documentation and disks for the Bridgeboard but not the other board (that's why I'm not sure what it does). Also included with the Bridgeboard is a 5 1/4" drive.

Now the bad news. The Bridgeboard has one,

count 'em, one bad RAM on it that should be fixed. It still runs without it but who knows what problems might arise when it tries to use that one bad RAM address.

The price for both boards is \$350 cash or money order.

If you are interested my vital stats are as follows:

Michael Loughman
817-465-0674

Amiga By-The-Loop Brent Wood

With about thirty members present at the July meeting we were down a little on attendance. (But that gives everyone who shows up a better chance at the door prize.) David Owens got things going with a few announcements. MetCom is fast approaching and anyone who wants to volunteer should contact any chapter or club officer. This is our big annual event and is gaining wider recognition each year. It takes a lot of people to pull it off and everyone is invited to help.

As soon as details are finalized, David Anspach is going to begin scheduling Amiga classes at Amazing Computers Fort Worth. Classes will be formed on any topic that enrollment will support. Fees will be minimal and there will be some hands-on training. Check with David for more info.

Gary Campbell, club and chapter librarian, announced that anyone who wants a particular library

disk should contact him before the chapter meeting. He will be more than happy to bring the disk or

make you a copy and sell you the disk for a buck. Cheap, eh? The library is so large that only the disks released in

the last year are at any chapter meeting. (Unless you call Gary.)

Our presentation was made by Scott Lamb, resident developer of Amiga (and other) software. He first shared with us some of the latest things about AmigaDOS 2.0 and the A3000. And a number of things from the developers conference. This is great inside information that you can spread around to other Amiga owners. It also is fun to rib the competition.

thank you and Computer Emporium, too.

Next meeting is as usual. Second Tuesday, 7:30, NRH Community Center.

Amiga Central Jack Smith

The Amiga Central meeting was the place to be on Thursday when

Amazing Computers presented the exciting new AmigaVision interactive multimedia program. Using the powerful new Amiga 3000 Dave answered a barrage of questions about the new program while ripping through a half dozen different demos. AmigaVision is Commodore's answer to the popular Macintosh Hypercard program and will be supplied with all new Amiga 500P, 2000's and 3000's beginning in July. Current Amiga owners can pick up this fantastic program at any Amiga dealer for just over \$100.00. Absolutely no programming experience required!

In other news, SigGraph will be held Aug. 6th-10th in Dallas this year and

Commodore will be there with the new CDTV laser disk player based on the Amiga 500. Don't miss it.

Take a moment to remember Rob Peck who passed on earlier this month. Rob was one of the original Amiga development team and we will all miss him.

Late breaking news: Disney Animation Studio will be on the shelf by Aug. 1st. Also, the Amiga was selected by the Dallas Mavericks to create all their animation sequences to be shown during home games. Commodore has announced the introduction of the Amiga 500C to mass-merchandising channels. Agreements were signed with Sears, Montgomery Ward, Macy's and J.C. Penney which will put the Amiga in hundreds of stores by the end of August. Coupled with the best

Thanks For The Doorprizes

These doorprizes were given away at the July meetings.

Amiga By-The-Loop Chapter:

Dogs of War

...donated by Computer Emporium

Amiga Central Chapter:

Jinx

AmigaVision Coffee Cup

Two PD Software Disks

...all donated by Amazing Computer Systems

Amiga North Dallas Chapter:

Aquanaut

...donated by Metropolitan Connecting Point

Jinx

...donated by Amazing Computers (Dallas)

AmigaVision Coffee Cup

...donated by Amazing Computers (Ft. Worth)

Our thanks to these dealers for their support.

Then Scott launched into a detailed explanation of Preferences with a few 2.0 changes to expect. Thanks to Scott for the fine demo.

Thanks also to Computer Emporium for the door prize and the table full of software and hardware. They also matched a locally advertised price on a product that was only available for a few days. If you missed the meeting you missed the deal. (And it was a deal!) Door prizes for the evening were donated by Computer Emporium and Ned Kelly, your club president.

Thanks Ned. And I'm sure that the winners, Wayne Brodnax and John Munsch,

CHAPTER

customer support program in the business we should see Amiga sales soar this fall.

Door prizes donated by Amazing Computers were won by Dee Simmons, John Malstrom and Mark Renfro.

Next month, Applied Engineering will demo their new Amiga line featuring 8 new hardware products.

Amiga North Dallas Genny White

It was Standing Room Only again in July as our growing membership brought lots of new faces to the meeting. Maybe we'll have a bigger location soon -- a few more members could make the difference in our options! Speaking of our membership, we're playing "musical officers" this month. Our hard-working librarian, Brett Hester, wants a chance to actually attend the meeting (rather than shuffle disks for 2 hours), so our Vice-President William Dockendorf will be taking the position as Head Disk Shuffler. Our Treasurer (and video guru) Bob Shary will step in as Vice President, making way for a new volunteer, Forrest McKinney, to become

Treasurer. If you need a little stability to cling to, Craig Bird remains our faithful President, and you're still stuck with me as Secretary.

So
you
have

your
Computer
for the
Creative Mind,
but now that you've
got it, what do you do
with it? David Anspach

is offering to hold classes for our club members at the Fort Worth Amazing Computers store. What would you like to have taught? Call him at 438-5684(h) or 333-6077(w) (Dallas numbers).

We had quite a turnout in July, considering the evening's highlights weren't announced in advance -- did you all come for the door prizes?

There
were
several
goodies

again
this time:
"Might and Magic" from William Dockendorf, "Aquanaut" from Metropolitan Computing, an AmigaVision mug from David Johnson and the Fort Worth Amazing store, and "Jinx" from the Dallas Amazing location. Harold Williams, in charge of the Door Prize jar, won the mug ... Very Suspicious. Keep an eye on him! Speaking of jars, please remember our Public Domain and ShareWare contribution collection -- these authors need and deserve our support.

Our next meeting will be August 15, 7:30 p.m., at the Richardson Civic Center. Come be surprised again by our Demo of the Month, or come for the door prizes, or come for the people who share your interests and value your voice!

Our Special
Presentation was a
demo of
AmigaVision by
David Johnson,
manager of
the Fort

Worth Amazing Computers store. This is the package you get as a bonus with the A3000, or can buy for your current machine for \$149.95 retail, or \$107.96 for user group members. Rather than a programming tool like CanDo, AmigaVision is a presentation tool that uses an "object editor" and simple flowchart-like statements (if-then, goto, loops) to tie together all the audio-visual special effects of the Amiga.

It comes with demos and a tutorial, and a very well-done manual. Icons represent each component type you wish to manipulate, and the associated requestors are very intelligent and detailed, with appropriate options and controls for the type of component you are setting up. You can link together screens,

sound, animation, speech, music, animation, even video, with control provided by timers, keyboard and mouse interrupts, variables (internal and user-entered), etc. There are a few limitations: only the type of animation files produced by Deluxe Paint III can presently be used within AmigaVision. Music must be SMUS format, and non-standard instruments will not work. A "runtime" package can be generated by a function that locates all the component files you've referenced, calculates the space required, and builds floppy disks to make your masterpiece portable. AmigaVision runs under either 1.3 or 2.0, and needs 3 meg of RAM and at least 20 meg of hard disk for development. (Runtime packages may run in 1 meg.) Although floppies can be used for runtime, the floppy-swapping and delays can mess up your smooth presentation.

This slick system was so fascinating that this almost became a full-fledged AmigaVision review, instead of a chapter update. Drop by

your dealer and see it for yourself! David Johnson did a fine job presenting it to us. Come join us next month and see what else is new!

Arlington/Grand Prairie Eddie Allen

Glen Herring presented Maverick V5, and Brad Dumler presented Sogwap's Big Blue Reader V3.1, giving us two programs that serve most every need. Maverick allows you to painlessly keep the all important backups of your disks, while BBR lets you transfer data back and forth between the MS/DOS formats and ours. BBR also transfers between CP/M and our format.

Unhappily, the telecommunications demonstration has been delayed one more month. It looks like the telecommunications bottleneck about telecommunications is going to be resolved. Thusly it looks very good for the August meeting.

Remember, our new meeting place is two dip SIGNS north of the old place. Until then, be cool.

Fort Worth Ellen Triplett

As of July, we began meeting in our new location - the Activity Room of the West Berry Church of Christ. We really are pleased with the facilities, the location, and the large

convenient parking lot just west of the building.

We did have a little excitement when

the security officers showed up after the burglar alarm went off. One of our members (who shall not be named) either did not hear or forgot that I told everyone we would be in the LAST building behind the main building.

He entered through a side door closer to the auditorium and asked some custodians where the computer club was meeting. Not knowing, they sent him the other direction and he walked through an electronic beam. When the security company called, we did not know the code number to give them, and had to do some fancy footwork trying to find one of the ministers or an elder who could get us off the hook. Incidentally, anyone who is coming to the meetings from now on, either regular members or visitors, PLEASE look for our signs on the doors before entering. The church has to pay extra any time security comes out.

After everything settled down our new president, John Sookma, brought our meeting to order. According to our rules, he will soon be appointing a vice-president to fill the vacancy he left.

Our program was literally a hodgepodge this time, as planned, beginning with a discussion of The Print Shop program and how she used it by Ellen Triplett.

Mary Louise Hagemeyer talked a bit about basic programming and asked for suggestions for future talks on the subject.

Donald Tate, librarian, brought to our attention several disks, #537, #527, #538, and #264, which he felt might be useful or fun for us. He also demonstrated File Drawer 4.5 which will be added soon to our club library.

Two computers were set up with programs for us to inspect. The first was using Sid Player in stereo with graphics (great sound), and the second with Party Quiz, a really fun game - especially for you Trivial Pursuit buffs. These were brought and set up by John & Julia Sookma, and they told us of a neat twist that can be used - adding your own personalized questions. They

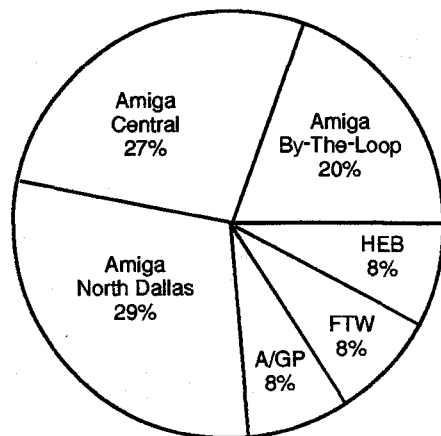
really floored some friends with questions which could only pertain to them. For instance, "Does (name) drive a (car brand or model)?" Check it out; I think you'll like it.

We welcomed one new addition to our chapter this time - Penny Cooper - a fairly new member of the club who had not been able to locate us. She went to our old meeting place. Do come and visit with us. We would be happy to have you.

H.E.B. Robyn Wilson

At the July 21st meeting, many new people attended. The chapter really needs the new members to replace past members that graduate to other chapters (Amiga and such). These new members brought up many questions that were discussed at the "Open Forum". It's good to see the interest that was displayed. Some of the topics discussed and demonstrated were GEOS, the Dos Wedge, and a game show program.

Our next meeting will be held on August 18th at the Hurst Recreation Center at 1:30 p.m. MetCom*90 is on its way! This will be held at the Arlington Convention Center in October. Here you can purchase Commodore products and programs and learn about what's new. Stay tuned for more information as October rolls up!



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The Fine Print

The Metroplex Commodore Computer Club

Statement of Purpose

The Metroplex Commodore Computer Club is a not-for-profit organization devoted to the collection and dissemination of computer knowledge, to the encouragement of computer education, and to the use of Commodore computers in the home, at school, and in business.

Legal Stuff

The MCCC is not connected with Commodore Business Machines, Inc. Commodore and Commodore product names (PET, CBM, VIC, C64, C128, and Amiga) are registered trademarks of Commodore, Inc.

Meetings and Membership

Our meetings are open to all. Family membership dues are \$20 per year or \$12 for six months, and entitle the member to a monthly mailed copy of the MCCC News, free access to the club's extensive public domain and shareware software library, and discounts at many area merchants. An additional \$12 annual fee provides access to the MCCC multi-user Bulletin Board System.

The MCCC News

Copyright Information

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Advertising

The MCCC News accepts two kinds of advertising. Member ads are those which are submitted by a member and which are not of a commercial nature. There is no charge for member ads. Commercial ads are those which advertise multiple like items for sale. Rates for camera-ready commercial ads are as follows for a single month or (consecutive three months): Full Page - \$36 (\$96); Half Page - \$18 (\$48); Quarter Page - \$12 (\$32); Business Card - \$6 (\$16). Materials to be inserted will cost \$.08 per copy (duplication not included) and must be inserted into all newsletters for the month.

Articles

Members are encouraged to submit articles. Articles should be submitted as ASCII text. They may be uploaded to the MCCC BBS, to StarText (address "MCCC"), or on disk. If these methods are not possible, I will, as a last resort, accept printed articles. If graphics need to be included they may be submitted as Amiga IFF files, PageStream structured drawings, or, again as a last resort, printed output.

Deadline

The deadline for submissions to the MCCC News is the Monday following the third Saturday of each month. Payment must accompany all ad copy. Make checks payable to MCCC and mail to P.O. Box 813, Bedford, Texas 76095.

Extra Copies

Extra Copies of the MCCC News may be obtained for \$1 per copy. Orders should be forwarded to the club along with the required fee. Orders must be received by the regular newsletter deadline.

CALENDAR OF EVENTS

- Aug 11 Fort Worth Chapter
1:30 pm - West Berry Church of Christ
2701 West Berry, Fort Worth
John Sookma, 817-346-6690
- Aug 11 Arlington/Grand Prairie Workshop
1:30 pm - Grand Prairie Library
Grand Prairie
Jerry Hiatt, 817-649-1358
- Aug 14 Amiga By-The-Loop Chapter
7:30 pm - N.Richland Hills Community Center
Loop 820 at Rufe Snow, N.Richland Hills
David Owens, 817-577-2304
- Aug 14 Arlington/Grand Prairie Chapter
7:00 pm - Stoneridge Homeowners Assn. Clbhs.
500 Grants Parkway, Arlington
Glen Herring, 817-572-0489

- Aug 15 Amiga North Dallas Chapter
7:30 pm - Richardson Civic Center
411 West Arapaho, Richardson
Craig Bird, 817-540-3360
- Aug 16 Amiga Central Chapter
7:30 pm - Arlington Community Center
2800 S. Center, Arlington
Bill Keatley, 817-485-0666
- Aug 18 Hurst-Euless-Bedford Chapter
1:30 pm - Hurst Recreation Center
Mary Drive South of Pipeline
Eldor Luedtke, Jr., 817-377-4135
- Aug 25 MCCC Board of Directors
10:00 am - N.Richland Hills Community Center
Loop 820 at Rufe Snow, N.Richland Hills
Ned Kelly, 817-277-5825

Special Date
For Sept

September Newsletter Deadline - August 20

NORMAL MEETING SCHEDULE

1st Sat MCCC Board of Directors
2nd Tues Amiga By-The-Loop Chapter
2nd Tues Arlington/Grand Prairie Chapter
2nd Sat Arlington/Grand Prairie Workshop

2nd Sat Fort Worth Chapter
3rd Wed Amiga North Dallas Chapter
3rd Thurs Amiga Central Chapter
3rd Sat HEB Chapter

MCCC NEWS

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